Louisiana Department of Environmental Quality (LDEQ)
Office of Environmental Services

STATEMENT OF BASIS

d/b/a Olin Chlor-Alkali Products
Pioneer Americas LLC
St. Gabriel, Iberville Parish, Louisiana
Agency Interest No.: 2644
Activity Number: PER20080008
Proposed Permit Number: 1280-00011-V0

I. APPLICANT

Company:
Pioneer Americas LLC
P.O. Box 23
St. Gabriel, LA 70776

Facility:
d/b/a Olin Chlor-Alkali Products
4205 Highway 75
St. Gabriel, LA 70776

Approximate UTM coordinates are 682.2 kilometers East and 3347.0 kilometers North, Zone 15
SIC Code: 2812

II. FACILITY AND CURRENT PERMIT STATUS

Pioneer Americas LLC operates an existing Chlor-Alkali Plant in St. Gabriel, Iberville Parish. The facility was first permitted as Stauffer Chemical on April 16, 1971. In 1988, ownership changed to Pioneer Chlor Alkali Company. In March 2004, the company changed its name to Pioneer Americas LLC. Permit No. 1280-00011-02 was issued October 12, 1998 and the small source exemption was issued March 5, 2004. On August 31, 2007 Olin Corporation purchased Pioneer Companies, Inc. and Pioneer Americas LLC, now d/b/a Olin Chlor Alkali Products, became part of Olin Corporation. d/b/a Olin Chlor Alkali Products (Olin) currently operates under Permit No. 1280-00011-03 issued on August 10, 2007.

III. PROPOSED PROJECT/PERMIT INFORMATION

Application

A permit application was submitted on May 22, 2008 and additional information dated July 11 and July 29, 2008 was also received to request the Title V permit.

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Project

Olin Chlor-alkali facility uses mercury cell technology to produce chlorine, sodium hydroxide, and hydrogen. In this process, purified saturated brine solution is electrolyzed to produce chlorine and sodium. The sodium dissolves in a liquid mercury cathode, forming a sodium/mercury amalgam which is reacted with water to produce 50% sodium hydroxide (NaOH) and hydrogen.

Olin proposes to replace the facility's mercury cell technology with membrane cell technology. The construction and operation of the Membrane Chlor-Alkali Unit will result in a positive environmental benefit. In order to continue to serve their customers, the Membrane Chlor-Alkai Unit must be constructed and commissioned before the Mercury Cell Chlor-Alkali Unit ceases operation.

Membrane technology relies on an ion-exchange membrane to separate the sodium and chloride ions of the sodium chloride.

Brine Purification

Saturated brine will be purchased and received via pipeline into the plant and will enter the purification system for heating, precipitation, filtration, ion exchange, and final storage of the ultra pure brine.

Electrolysis

Caustic soda (NaOH) and chlorine will be produced by the electrolysis of an aqueous solution of ultra pure brine.

The cells will be supplied with ultra pure brine through the anode compartment, where chlorine is generated. A constant pressure difference between the cathode and anode compartment is essential for safe operation of the cells. If the cell pressure increases excessively, the chlorine gas is vented to the neutralization scrubber.

The electrolytic reaction and dilution of the circulating catholyte stream require additional water. Required water is supplied by the water transport phenomenon through the membrane and by addition of distilled water according to load. Hydrogen and hydroxide ions are generated from water at the cathodes. The two phase mixture of caustic and hydrogen is sent to a gas separator where the hydrogen is separated from the catholyte and flows to the hydrogen main header. The catholyte is then sent to the catholyte tank.

Chlorine gas is generated at the anode. The two phase mixture of chlorine and anolyte is discharged into a gas separator where the major part of the chlorine gas is separated from the anolyte and flows to the chlorine main header. The anolyte is then sent to the anolyte tank.

Chlorine leaving the cells is cooled, dried, compressed, and liquefied before shipment to customers by pipeline. The facility currently ships all produced chlorine by pipeline and unloads rail cars to complement maximum flows into the pipeline.

Brine Dechlorination

The anolyte flowing from the cells is saturated with chlorine gas. Hydrochloric acid is added to the anolyte to facilitate the release of dissolved chlorine. The anolyte will enter the existing dechlorination unit for chlorine desorption and bisulfite treatment. The dechlorinated brine is then returned via pipeline.

Hydrogen Treatment

Hydrogen from the cells is saturated with water and contains entrained caustic. The process hydrogen will enter a treatment system, where the gas is cooled and filtered. The hydrogen stack will be used for emergency venting. Hydrogen will either be sold or used in Boiler D (17-08, EQT0020) as fuel.

Boilers

Pioneer Americas, LLC will construct and operate a 130,000 lb/hr steam generating boiler (Boiler D, 17-08, EQT0020). Steam generated from the boiler will primarily be used for the caustic concentration units. The boiler will use natural gas or a mixture of process hydrogen supplemented with natural gas for fuel. Boiler C (6-78, EQT0003) will normally operate in stand-by mode and only operate at full capacity if Boiler D is not operating. The revised calculations for Boiler C are based on 90 days/year of operating at full rates with the remainder of the year operating in stand-by mode.

This permit addresses the entire facility, including both the mercury cell and the membrane cell chlor-alkali unit. The following sources need to remain in the permit until they are permanently decommissioned:

- The outlet Endbox Vent (RLP0005),
- Hydrogen Processing Equipment Vent (RLP0006),
- Boiler A (EQT0002),
- Sodium Chloride Handling (EQT0004), and
- Diesel Storage Tank T-819 (EQT0005).

No later than 90 days after the mercury cell chlor-alkali unit is permanently decommissioned, Pioneer Americas, LLC shall submit permit modification to remove above sources from the permit.

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Estimated emissions from this facility in tons per year are as follows:

Pollutant	Before	After	Change
PM_{10}	49.03	25.11	-23.92
SO_2	11.02	2.91	- 8.11
NO_X	42.71	47.58	+4.87
CO	3.47	42.80	+39.33
VOC	4.35	6.24	+ 1.89
Hg (and compounds)	0.612	0.60	- 0.01

LAC 33:III. Chapter 51 Toxic Air Pollutants TAP's	Emissions in Tons per year
Methyl ethyl ketone	1.47
Styrene	0.52
Cl_2	0.10
HCl	0.02
H_2SO_4	0.01
Hg (and compounds)	0.60
Total TAPs	2.72

IV REGULATORY ANALYSIS

The applicability of the appropriate regulations is straightforward and provided in the Specific Requirements section of the proposed permit. Similarly, the Monitoring, Reporting and Recordkeeping necessary to demonstrate compliance with the applicable terms, conditions and standards are also provided in the Specific Requirements section of the proposed permit.

Applicability and Exemptions of Selected Subject Items

See section X and XI of the Title V permit.

Prevention of Significant Deterioration/Nonattainment Review

A PSD review is not required by this permit modification.

This permit was reviewed for compliance with 40 CFR 70, the Louisiana Air Quality Regulations, New Source Performance Standards (NSPS), and National Emission Standards for Hazardous Air Pollutants (NESHAP).

This facility is a minor source of toxic air pollutants (TAPs) pursuant to LAC 33:III.Chapter 51.

MACT Requirements

Pioneer Americas LLC's Chlor-alkali facility is a minor source of toxic air pollutants.

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Air Quality Analysis

Emissions associated with the proposed permit modification were reviewed by the Air Quality Assessment Division to ensure compliance with the NAAQS and AAS. LDEQ did not require the applicant to model emissions.

The following is the modeling result from last permit modification:

Dispersion Model(s) Used: ISCST3

Pollutant	Time Period	Calculated Maximum Ground Level Concentration	Louisiana Ambient Air Quality Standard (NAAQS)
Mercury	8-hour	0.43 $\mu g/m^3$	1.19 $\mu g/m^3$

General Condition XVII Activities

The facility will comply with the applicable General Condition XVII Activities emissions as required by the operating permit rule. However, General Condition XVII Activities are not subject to testing, monitoring, reporting or recordkeeping requirements. For a list of approved General Condition XVII Activities, refer to the Section VIII – General Condition XVII Activities of the proposed permit.

Insignificant Activities

All Insignificant Activities are authorized under LAC 33:III.501.B.5. For a list of approved Insignificant Activities, refer to the Section IX – Insignificant Activities of the proposed permit.

V. PERMIT SHIELD

No permit shield is requested in these permits.

VI. PERIODIC MONITORING

See 'Specific Requirements' section of the permit.

VII. GLOSSARY

Carbon Monoxide (CO) – A colorless, odorless gas, which is an oxide of carbon.

Maximum Achievable Control Technology (MACT) – The maximum degree of reduction in emissions of each air pollutant subject to LAC 33:III.Chapter 51 (including a prohibition on such emissions, where achievable) that the administrative authority, upon review of submitted MACT compliance plans and other relevant information and taking into consideration the cost of achieving such emission reduction, as well as any non-air-quality health and environmental impacts and energy requirements, determines is achievable through application of measures, processes, methods, systems, or techniques.

Hydrogen Sulfide (H_2S) – A colorless inflammable gas having the characteristic odor of rotten eggs, and found in many mineral springs. It is produced by the reaction of acids on metallic sulfides, and is an important chemical reagent.

New Source Review (NSR) – A preconstruction review and permitting program applicable to new or modified major stationary sources of air pollutants regulated under the Clean Air Act (CAA). NSR is required by Parts C ("Prevention of Significant Deterioration of Air Quality") and D ("Nonattainment New Source Review").

Nitrogen Oxides (NO_X) – Compounds whose molecules consist of nitrogen and oxygen.

Organic Compound – Any compound of carbon and another element. Examples: Methane (CH_4), Ethane (C_2H_6), Carbon Disulfide (CS_2)

Part 70 Operating Permit – Also referred to as a Title V permit, required for major sources as defined in 40 CFR 70 and LAC 33:III.507. Major sources include, but are not limited to, sources which have the potential to emit: $\geq$ 10 tons per year of any toxic air pollutant; $\geq$ 25 tons of total toxic air pollutants; and $\geq$ 100 tons per year of regulated pollutants (unless regulated solely under 112(r) of the Clean Air Act) (25 tons per year for sources in non-attainment parishes).

PM_{10} – Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by the method in Title 40, Code of Federal Regulations, Part 50, Appendix J.

Potential to Emit (PTE) – The maximum capacity of a stationary source to emit any air pollutant under its physical and operational design.

Prevention of Significant Deterioration (PSD) – A New Source Review permitting program for major sources in geographic areas that meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. PSD requirements are designed to ensure that the air quality in attainment areas will not degrade.